IN THE CLAIMS:

Please amend claims 2-31, 33, 38-40, and 42-43, and add new claim 52 as follows:

1. (Previously Presented) A semiconductor radiation imaging assembly, comprising:

a semiconductor imaging device including at least one high energy direct conversion image element detector;

said semiconductor imaging device comprising a semiconductor substrate supporting a first and second conductive layer on respective first and second surfaces, said second conductive layer comprising an image element electrode and said first and second conductive layers at least partially opposing each other for applying a bias therebetween to define a radiation detection zone for said image element detector; and

bias signal monitoring means for monitoring a bias signal applied to said first conductive layer for determining radiation incident on said image element detector.

2. (Currently Amended) An imaging assembly according to Claim 1, wherein said first conductive layer ~~comprising~~ comprises a substantially continuous layer across said first substrate surface, and said second conductive layer ~~comprising~~ comprises a plurality of image element electrodes for defining respective radiation detection zones for a plurality of image element detectors.

3. (Currently Amended) An imaging assembly according to Claim 1 wherein said bias signal monitoring means is adapted to provide a trigger signal for said bias signal fulfilling a predetermined criterion.

4. (Currently Amended) An imaging assembly according to Claim 1, wherein said bias signal monitoring means is adapted to determine a rate of change for said bias signal.

5. (Currently Amended) An imaging assembly according to Claim 4, wherein said bias signal monitoring means is adapted to discriminate between more than one rate of change of said bias signal.

6. (Currently Amended) An imaging assembly according to Claim 3, wherein said trigger signal is initiated in response ~~responsive~~ to a transgression of a threshold value for said bias signal indicative of a start of a radiation exposure or end of a radiation exposure.

7. (Currently Amended) An imaging assembly according to Claim 6, wherein said trigger signal ~~comprising~~ comprises a begin exposure trigger signal for said threshold value indicative of said start of radiation exposure.

8. (Currently Amended) An imaging assembly according to Claim 7, wherein said trigger signal is initiated in response to said bias signal upwardly transgressing said threshold value.

9. (Currently Amended) An imaging assembly according to Claim 6 ~~3~~, wherein said trigger signal ~~comprising~~ comprises an exposure trigger for said threshold value indicative of said end of radiation exposure.

10. (Currently Amended) An imaging assembly according to Claim 9, wherein said trigger signal is initiated in response to said bias signal downwardly transgressing said threshold value.

11. (Currently Amended) An imaging assembly according to Claim 1, said bias signal monitoring means comprising:

a differentiator ~~means~~ for differentiating a signal representative of said bias signal;

a low pass filter ~~means~~ for low pass filtering said differentiated signal; and

a comparator for comparing said low pass filtered signal with a threshold value.

12. (Currently Amended) An imaging assembly according to Claim 11, wherein said ~~means for differentiating comprising~~ differentiator comprises a high pass filter.

13. (Currently Amended) An imaging assembly according to Claim 1, wherein said bias signal monitoring means is adapted to determine accumulated bias signal values representative of aggregate radiation incident on said image element detector.

14. (Currently Amended) An imaging assembly according to Claim 13, wherein said bias signal monitoring means is responsive to said accumulated bias signal value fulfilling a predetermined criterion to initiate a trigger signal.

15. (Currently Amended) An imaging assembly according to Claim 14, wherein said predetermined criterion ~~comprising~~ comprises said accumulated bias signal value transgressing a first threshold value ~~to provide~~ thereby providing a begin of exposure trigger signal.

16. (Currently Amended) An imaging assembly according to Claim 14 ~~15~~, wherein said predetermined criterion ~~comprising~~ comprises said accumulated bias signal value transgressing a second threshold value to provide an end of exposure trigger signal.

17. (Currently Amended) An imaging assembly according to Claim 16, wherein said bias signal monitoring means is adapted to subtract an image element quiescent bias signal value from a signal representative of said bias signal.

18. (Currently Amended) An imaging assembly according to Claim 16, said bias signal monitoring means comprising:

an integrator ~~means~~ for integrating a signal representative of said bias signal; and

a comparator for comparing said integrated signal with said first and/or second threshold value.

19. (Currently Amended) An imaging assembly according to Claim 17, wherein said bias signal monitoring means further ~~comprising~~ comprises sample and hold circuitry for recording an image element quiescent bias signal value[[,]]; and subtraction means for subtracting said image element quiescent bias signal value from said signal representative of said bias signal so as to form ~~for forming~~ a quiescent bias signal corrected bias signal.

20. (Currently Amended) An imaging assembly according to Claim 19, wherein said sample and hold circuitry is resettable to update said recorded image element quiescent bias signal value prior to said bias signal monitoring means initiating measurement of said accumulated bias signal.

21. (Currently Amended) An imaging assembly according to Claim 1, wherein said bias signal monitoring means is adapted to integrate a signal representative of said bias signal and to subtract said integrated signal from said signal representative of said bias signal so as to derive a signal representative of radiation incident on said image element detector.

22. (Currently Amended) An imaging assembly according to Claim 21, wherein said bias signal monitoring means is adapted to integrate said signal representative of radiation so as to generate an integrated signal representative of radiation.

23. (Currently Amended) An imaging assembly according to Claim 22, wherein said bias signal monitoring means is responsive to said integrated signal representative of radiation fulfilling a predetermined criterion to provide a trigger signal.

24. (Currently Amended) An imaging assembly according to Claim 23, wherein said predetermined criterion ~~comprising~~ comprises said integrated signal representative of radiation transgressing a first threshold value to provide a start of exposure trigger signal.

25. (Currently Amended) An imaging assembly according to Claim 24, wherein said predetermined criterion ~~comprising~~ comprises said integrated signal representative of radiation transgressing a second threshold value to provide an end of exposure trigger signal.

26. (Currently Amended) An imaging assembly according to Claim 25, wherein said bias signal monitoring means ~~comprising~~ comprises a comparator for comparing said integrated signal representative of radiation with said first threshold value and/or said second threshold value.

27. (Currently Amended) An imaging assembly according to Claim 1, wherein said bias signal monitoring means is adapted to monitor bias signal current.

28. (Currently Amended) An imaging assembly according to Claim 1, wherein said bias monitoring means is adapted to monitor bias signal voltage.

29. (Currently Amended) An imaging assembly according to Claim 1, wherein said image device ~~comprising~~ comprises a plurality of detector elements, and said bias monitoring means is arranged to monitor said bias signal ~~monitored~~ for at least some of said image elements.

30. (Currently Amended) An imaging assembly according to Claim 29, wherein said bias monitoring means is arranged to monitor said bias signal ~~monitored~~ for all of said image elements.

31. (Currently Amended) An imaging assembly according to Claim 1, wherein said bias signal monitoring means is integral with said imaging device.

32. (Previously Presented) A semiconductor radiation imaging system, comprising:

a semiconductor imaging assembly according to Claim 1;

control electronics coupled to said imaging assembly for receiving signals, including trigger signals, therefrom;

signal storage means for storing signals coupled from said control electronics;

an image processor for processing signals coupled from said control electronics; and

a display unit for displaying images provided by said image processor.

33. (Currently Amended) An imaging system according to Claim 32, wherein said control electronics are responsive to a trigger signal from said imaging assembly to initiate an image frame selection from said signals stored in said storage means.

34. (Currently Amended) A method for providing a self-triggerable semiconductor imaging assembly, the assembly comprising a semiconductor imaging assembly according to Claim 1, said method comprising:

~~a semiconductor imaging device including at least one high energy direct conversion image element detector;~~

~~said semiconductor imaging device comprising a semiconductor substrate supporting a first and second conductive layer on respective first and second surfaces, said second conductive layer comprising an image element electrode and said first and second conductive layers at least partially opposing each other for applying a bias therebetween to define a radiation detection zone for said image element detector; and~~

~~bias signal monitoring means for monitoring a bias signal applied to first conductive layer for determining radiation incident on said image element detector, said method comprising:~~

monitoring a bias signal for applying a bias to said image element detector so as to monitor radiation incident on said image element detector; and

initiating a trigger signal conditional on said bias signal fulfilling a predetermined condition.

35. (Previously Presented) A method according to Claim 34, further comprising determining a change in said bias signal corresponding to a change in radiation incident on said image element detector.

36. (Previously Presented) A method according to Claim 35, further comprising determining a rate of change for said bias signal.

37. (Previously Presented) A method according to Claim 36, further comprising discriminating between more than one rate of change for said bias signal.

38. (Currently Amended) A method according to Claim 36, in which said rate of change is indicative of a start of radiation exposure or end of radiation exposure.

39. (Currently Amended) A method according to Claim 37, in which said trigger signal ~~comprising~~ comprises a start of exposure trigger signal for said rate of change indicative of a start of radiation exposure.

40. (Currently Amended) A method according to Claim 38, in which said trigger signal ~~comprising~~ comprises an end of exposure trigger signal for said rate of change indicative of an end of radiation exposure.

41. (Previously Presented) A method according to Claim 34, further comprising determining accumulated bias signal representative of aggregate radiation incident on said image element detector.

42. (Currently Amended) A method according to Claim 43, further comprising initiating a trigger signal for said accumulated bias ~~fulfils~~ fulfilling a predetermined condition.

43. (Currently Amended) A method according to Claim 42, in which said predetermined condition ~~comprising~~ comprises said accumulated bias signal transgressing a threshold value.

44. (Previously Presented) A method according to Claim 43, further comprising initiating a start of exposure trigger signal for said accumulated bias signal transgressing a first threshold value.

45. (Previously Presented) A method according to Claim 43, further comprising initiating an exposure trigger signal for said accumulated bias signal transgressing a second threshold value.

46. (Previously Presented) A method according to Claim 41, further comprising:

determining an image element detector quiescent bias signal value;

subtracting said image element detector quiescent bias signal value from a signal representative of said bias signal; and

accumulating said bias signal after subtraction of said image element detector quiescent bias signal value.

47. (Previously presented) A method according to Claim 34, further comprising:

low pass filtering a signal representative of said bias signal;

subtracting said low pass filtered signal from said signal representative of said bias signal for deriving a signal representative of radiation incident on said image element detector;

low pass filtering said signal representative of radiation; and

initiating a trigger signal for said low pass filtered signal representative of radiation fulfilling a predetermined condition.

48. (Previously Presented) A method according to Claim 47, further comprising initiating a start of exposure trigger signal for said low pass filtered signal representative of radiation transgressing a first threshold value.

49. (Previously Presented) A method according to Claim 47, further comprising initiating an exposure trigger signal for said integrated signal representative of radiation transgressing a second threshold value.

50. (Previously Presented) A method according to Claim 34, wherein said step of monitoring said bias signal comprises monitoring bias signal current.

51. (Previously Presented) A method according to claim 34, wherein said step of monitoring said bias signal comprises monitoring bias signal voltage.

52-55 (Canceled).

56. (New) A semiconductor radiation imaging assembly, comprising:

a semiconductor imaging device including at least one high energy direct conversion image element detector;

said semiconductor imaging device comprising a semiconductor substrate supporting a first and second conductive layer on respective first and second surfaces, said second conductive layer comprising an image element electrode and said first and second conductive layers at least partially opposing each other for applying a bias therebetween to define a radiation detection zone for said image element detector; and

bias monitoring means for monitoring a bias signal applied to said conductive layer, said bias monitoring means being for use in controlling readout from said radiation detection zone so as to determine radiation incident on said image element detector.